

RIVERS AND FLOODS

[River and Flood Division, MERRILL BERNARD in Charge]

By BENNETT SWENSON

The principal floods during January 1938 occurred as a result of a prolonged period of heavy precipitation from about the 20th–25th over an extensive area. The center of heaviest precipitation during this period was located over Arkansas and western Tennessee; and from this point the precipitation area extended to eastern and central Texas, to Illinois and Wisconsin, and to New England, with light to moderate floods in much of this area. Additional rains at the close of the month from central Kentucky to Louisiana, and in the Rock River basin in Illinois, prolonged the floods in those sections, with the flood period extending into February in most cases.

Abundant precipitation occurred also in the North Pacific slope area following the above-normal rainfall in that section in December. However, moderate flooding resulted only in the Willamette River basin in Oregon, causing no serious damage.

Other regions visited by floods were portions of the Roanoke, Cape Fear, and Santee Rivers in North and South Carolina and the Tombigbee and Pearl Rivers in Alabama and Mississippi. These floods were of minor character, and no appreciable amount of damage occurred.

Atlantic Slope drainage.—A flood occurred in the Connecticut Valley and was caused by mild temperature and moderate to heavy rain on the night of January 24–25, falling on an above average snow cover. In Connecticut and parts of Massachusetts the 10- to 15-inch snow cover entirely disappeared over night. The rain and melting snow resulted in higher stages in many of the headwaters of the tributary streams than those of the all-time high stages of March 1936. The Connecticut River, however, was rising from low stages and did not exceed flood stage at any of the regular reporting stations except Hartford, Conn. The crest at that point was 19.6 feet on January 26, 3.6 feet above flood stage. No damage of consequence was reported.

Similar conditions over the headwaters of the Susquehanna River basin resulted in floods over portions of the Chenango and Tioughnioga Rivers in New York; and the Susquehanna River exceeded flood stage at Oneonta and Bainbridge, N. Y., on the 25th–26th. The stages were not high, however, and little damage occurred, being confined mostly to delays and inconvenience to road traffic.

Upper Mississippi Basin.—A well-developed low-pressure area, moving from the southwest, was located over central Illinois on the morning of January 24. Heavy rains and mild temperatures, accompanying this disturbance, melted the snow cover; and the combined run-off filled the streams in Illinois and southern Wisconsin, and caused a breaking up of the ice. Considerable flooding resulted principally in the Rock River in Illinois and Wisconsin. A second disturbance over the same area, on the night of the 29th, accompanied by another period of moderately heavy rain and mild temperature, caused further high stages in that stream which continued into February. A more complete report of this flood will be given in the next issue of the REVIEW.

Flooding also occurred in the Illinois River, with flood stages being exceeded at Peru and Havana, Ill. The over-

flow in this case was not great and no damage of consequence was reported.

Lower Mississippi drainage.—Portions of the St. Francis, Yazoo, White, Arkansas, and Red Basins experienced floods during the latter part of the month because of almost continuous heavy rain over much of that section from January 20–25. Of the regular Weather Bureau stations, Little Rock, Ark., reported the greatest 24-hour amount, 4.62 inches on the morning of January 21, followed by 2.76 inches in the next 24 hours. Moderately heavy rains occurred again in this section on the 30th–31st and prolonged the flood in some parts.

The highest stages occurred in the Ouachita River at Camden, Ark., where a stage of 40.7 feet (flood stage 26 feet) was reached on January 27. A total damage estimated at about \$28,000, occurred.

The Cypress and Sulphur Rivers in Texas and the Little River in Arkansas, all tributaries of the Red River, and the lower portion of the Red proper, were in flood the latter part of the month. The before-mentioned tributaries were also in flood at the beginning of January.

Floods in the Red, Arkansas, White, Yazoo, and St. Francis Basins continued, for the most part, into February; and in some cases, exceeded the stages reached in January. Consequently, a final report will have to be given at a later date.

The estimated damages in the Red River Basin during the month are as follows: Red River above Shreveport, La., \$60,450; Sulphur River below Ringo Crossing, Tex., \$39,500; Cypress River in vicinity of Jefferson, Tex., \$8,150; and Little River, \$1,610.

West Gulf of Mexico drainage.—Heavy rain over most of eastern Texas, January 21–23, caused sharp rises principally in the Trinity, Brazos, and Guadalupe Rivers. The floods were localized due to the local character of the excessive rains. More damage probably resulted from the excessive rains than from the floods. Dallas, Tex., reported 3.08 inches of rain in 24 hours on the morning of the 22d and 1.36 inches in the following 24 hours.

The Trinity River reached a stage of 36.5 feet at Dallas on January 24, 8.5 feet above flood stage, and 39.8 feet at Trinidad, Tex., on January 29, 11.8 feet above flood stage. However, the West Fork of the Trinity at Fort Worth, Tex., did not reach flood stage. The total estimated loss in the Trinity River Basin was about \$60,000, most of which occurred in the vicinity of Fort Worth, Tex.

The Brazos River exceeded flood stage by 3 feet at Waco, Tex., on January 24, with estimated damage amounting to about \$10,000.

A small flood occurred in the Guadalupe River, exceeding flood stage at Gonzales and Victoria, Tex. No losses of consequence were reported.

A report, received too late for inclusion in the December issue of the REVIEW, indicates that Kings River, in the San Joaquin River Basin, reached the highest stage of record at Piedra, Calif., 20.05 feet on December 11. Damages are estimated as follows: Roads and bridges, \$139,850; weirs and levees, \$102,000; railroads, \$27,800.

Another report, concerning the flood in the Wabash-White River in December gives an estimated loss of about \$7,000, mostly confined to the White River.

Table of flood stages during January 1938

[All dates in January unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	<i>Feet</i>			<i>Feet</i>	
Connecticut: Hartford, Conn.-----	16	26	28	19.6	26
Schuylkill: Reading, Pa.-----	7	25	26	8.0	25
Tioughnioga: Whitney Point, N. Y.-----	12	25	26	13.2	25
Chenango:					
Sherburne, N. Y.-----	8	25	25	8.0	25
Greene, N. Y.-----	8	26	26	8.0	26
Susquehanna:					
Oneonta, N. Y.-----	12	25	27	15.2	25
Bainbridge, N. Y.-----	12	25	26	12.9	26
James: Columbia, Va.-----	10	26	28	12.4	27
Roanoke: Williamston, N. C.-----	10	12	16	10.2	13, 14
Cape Fear: Elizabethtown, N. C.-----	20	30	(1)	10.2	31
Santee:		9	9	20.8	9
		Dec. 30	1	12.8	Dec. 31
Rimini, S. C.-----	12	6	9	12.5	8
		12	15	12.6	13
		20	22	12.5	21
		28	29	12.2	28
		1	1	12.0	1
Ferguson, S. C.-----	12	14	15	12.1	15
		22	22	12.0	22
EAST GULF OF MEXICO DRAINAGE					
Tombigbee: Lock No. 3.-----	33	2	7	35.9	5
Pearl: Jackson, Miss.-----	18	2	13	21.2	8
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Rock: Moline, Ill.-----	10	25	(1)	13.8	30
Illinois:					
Peru, Ill.-----	17	25	25	18.1	25
Havana, Ill.-----	14	31	31	17.0	31
		30	(1)	15.0	Feb. 1
Ohio Basin					
West Fork of White: Anderson, Ind.-----	8	1	3	8.4	2
		25	26	8.1	26
Cumberland:					
Celina, Tenn.-----	28	24	26	29.8	25
Lock No. 6.-----	35	25	27	35.8	26
Tennessee: Hales Bar Lock, Tenn. (upper gate)-----	44	27	27	44.1	27
White Basin					
White:					
Batesville, Ark.-----	23	25	26	23.3	25
Georgetown, Ark.-----	21	30	Feb. 7	22.3	Feb. 2
Clarendon, Ark.-----	26	29	Feb. 13	27.7	Feb. 7
St. Charles, Ark.-----	24	29	(1)	25.9	Feb. 8-10

1 Continued at end of month.

Table of flood stages during January 1938—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
Arkansas Basin					
Poteau: Poteau, Okla.	Feet 21	22	28	Feet 31.7	25
Petit Jean: Danville, Ark.	20	{ 22 31	{ 29 (1)	27.1	25
Red Basin					
Little Missouri: Boughton, Ark.	20	23	27	22.9	25
Ouachita:					
Arkadelphia, Ark.	17	22	27	26.0	24
Camden, Ark.	26	23	Feb. 6	40.7	27
Little: Whitecliffs, Ark.	25	24	(1)	31.0	26
Sulphur:					
Ringo Crossing, Tex.	20	{ 1 21 31	{ 1 28 (1)	21.8 32.0	1 24
Naples, Tex.	22	{ Dec. 22 23	{ 8 (1)	27.7 35.0	Dec. 31 25
Cypress: Jefferson, Tex.	18	{ Dec. 30 26	{ 5 (1)	23.6 25.7	1 27
Red:					
Index, Ark.	25	25	27	25.8	26
Fulton, Ark.	25	24	(1)	32.9	28
Grand Ecore, La.	33	31	(1)		
Alexandria, La.	32	30	(1)		
Lower Mississippi Basin					
Big Lake Outlet: Manilla, Ark.	10	{ Dec. 30 26	{ 5 (1)	10.4	1, 2
St. Francis:					
Fisk, Mo.	20	25	28	22.8	26
St. Francis, Ark.	18	29	(1)		
Tallahatchie: Swan Lake, Miss.	26	28	(1)		
WEST GULF OF MEXICO DRAINAGE					
Sabine: Logansport, La.	25	13	21	27.3	17
Elm Fork: Carrollton, Tex.	6	23	25	8.1	24
Trinity:					
Dallas, Tex.	28	22	26	36.5	24
Trinidad, Tex.	28	{ Dec. 29 23	{ 3 (1)	31.0 39.8	25 26
Long Lake, Tex.	40	{ 5 6	{ 6 (1)	40.1 45.0	1 26
Liberty, Tex.	24	12	14	24.6	13
Grazos: Waco, Tex.	27	24	24	30.2	24
Buadalupe:					
Gonzales, Tex.	20	24	26	27.6	25
Victoria, Tex.	21	27	28	22.7	28
PACIFIC SLOPE DRAINAGE					
Columbia Basin					
Santiam: Jefferson, Oreg.	10	22	23	14.5	25
Willamette:					
Harrisburg, Oreg.	10	22	24	13.0	25
Oregon City, Oreg.	12	Dec. 26	3	16.3	Dec. 31

1 Continued at end of month.

WEATHER ON THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, I. R. TANNEHILL in Charge]

NORTH ATLANTIC OCEAN, JANUARY 1938

By H. C. HUNTER

Atmospheric pressure.—The North Atlantic HIGH and the Icelandic low were both unusually well developed during the month. The latter was more intense than usual practically all the time after the first week, and was displaced somewhat to eastward of its average position. The pressures for the month averaged about 0.3 inch less than normal at Reykjavik and at Lerwick.

The North Atlantic HIGH similarly was displaced considerably to eastward. The greatest average excess of pressure, 0.16 inch, is noted at Madeira, though at Horta the average pressure was slightly higher than at Madeira. This HIGH was best developed from the 21st to the end of the month.

Near the American coast, from Labrador to Maine and to eastward beyond the Grand Banks, there was a moderate excess of pressure; while from the vicinity of Cape Cod to the straits of Florida and to eastward far beyond Bermuda the pressure averaged somewhat less than normal.

The extreme pressure readings in the January vessel reports now available are 30.85 and 28.02 inches. The higher reading was observed on the French motor vessel *Pierre L. D.* when in approximately 43° N., 25° W., during the forenoon of the 27th. The lower reading has come from the American steamer *Cliffwood*, which noted it early on the 13th, near 60° N., 12° W. The meteorological station at Lerwick, Shetland Islands, had the same sea level pressure on the 29th, as table 1 indicates.